

Arabinose

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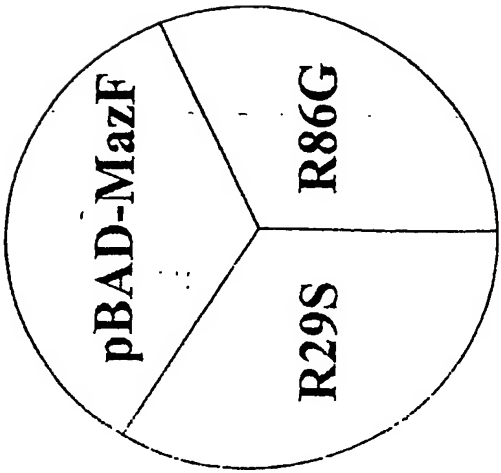


FIG. 1A

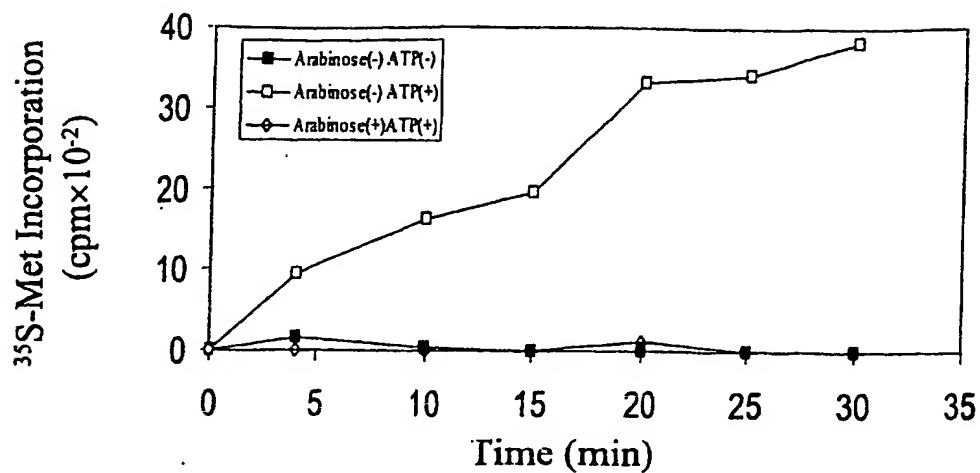


FIG. 2A

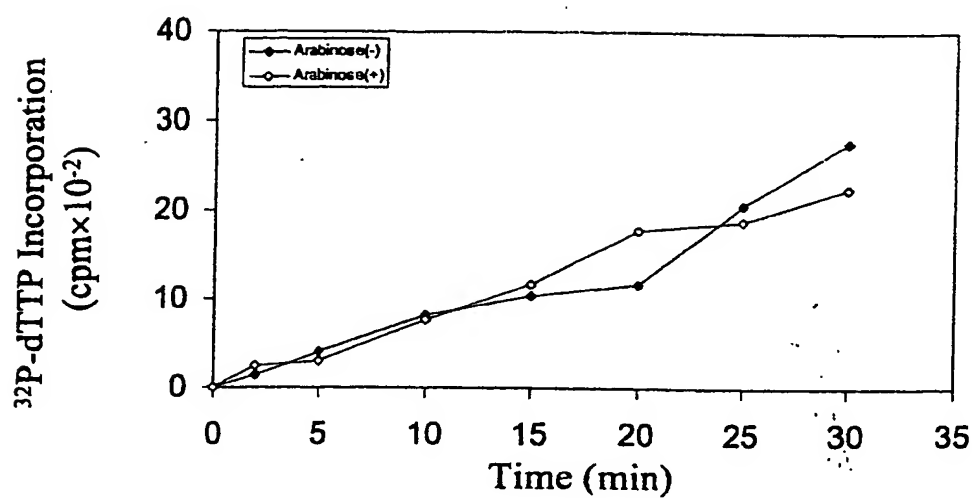


FIG. 2B

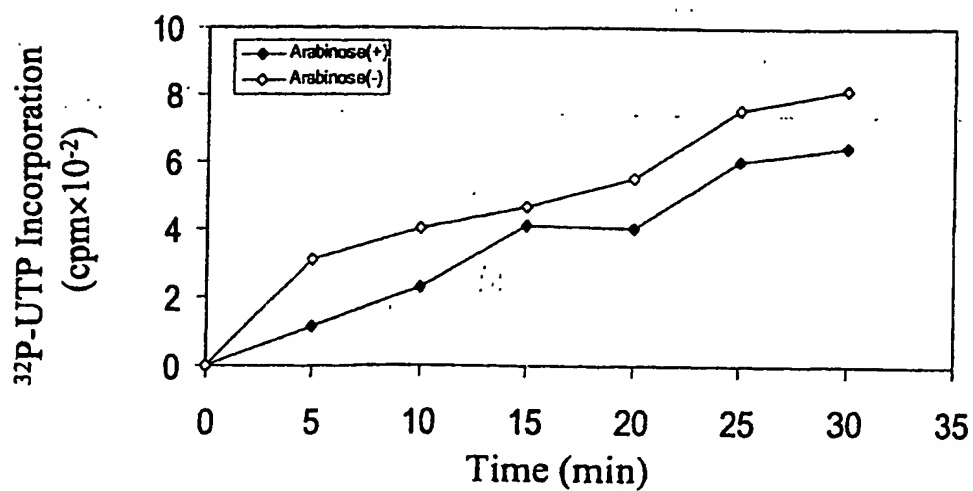


FIG. 2C

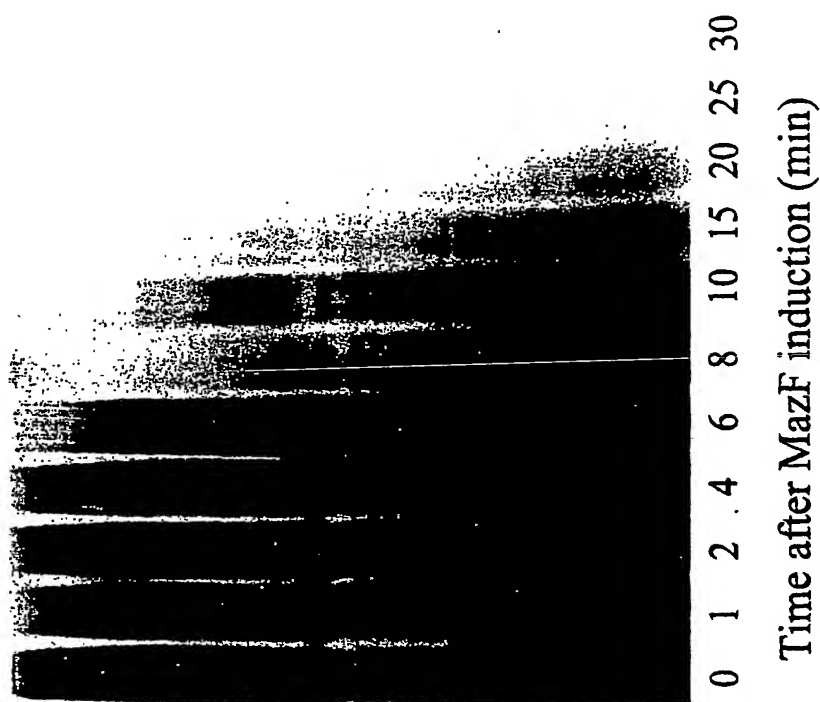


FIG. 2E

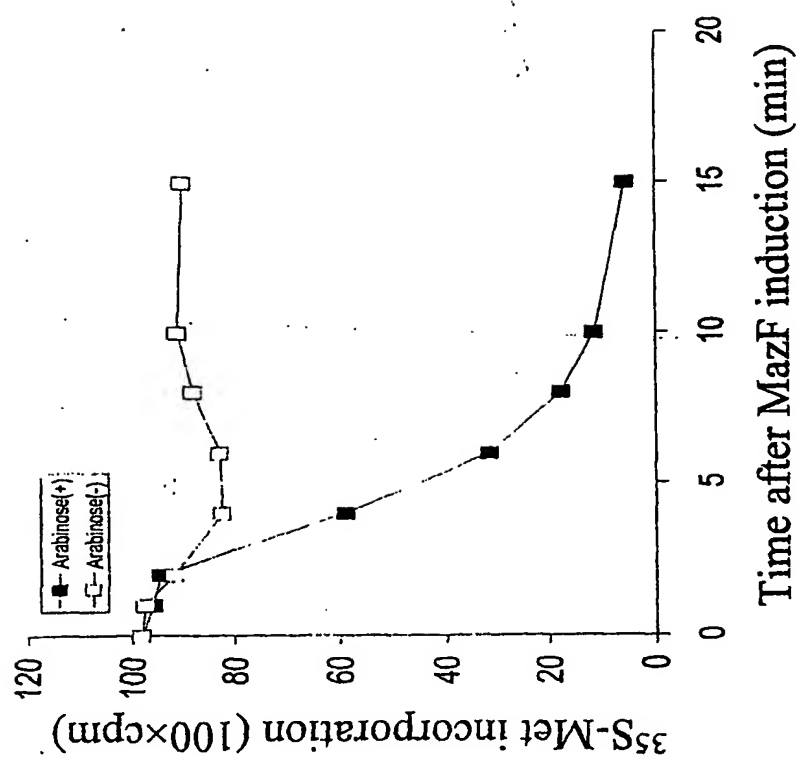


FIG. 2D

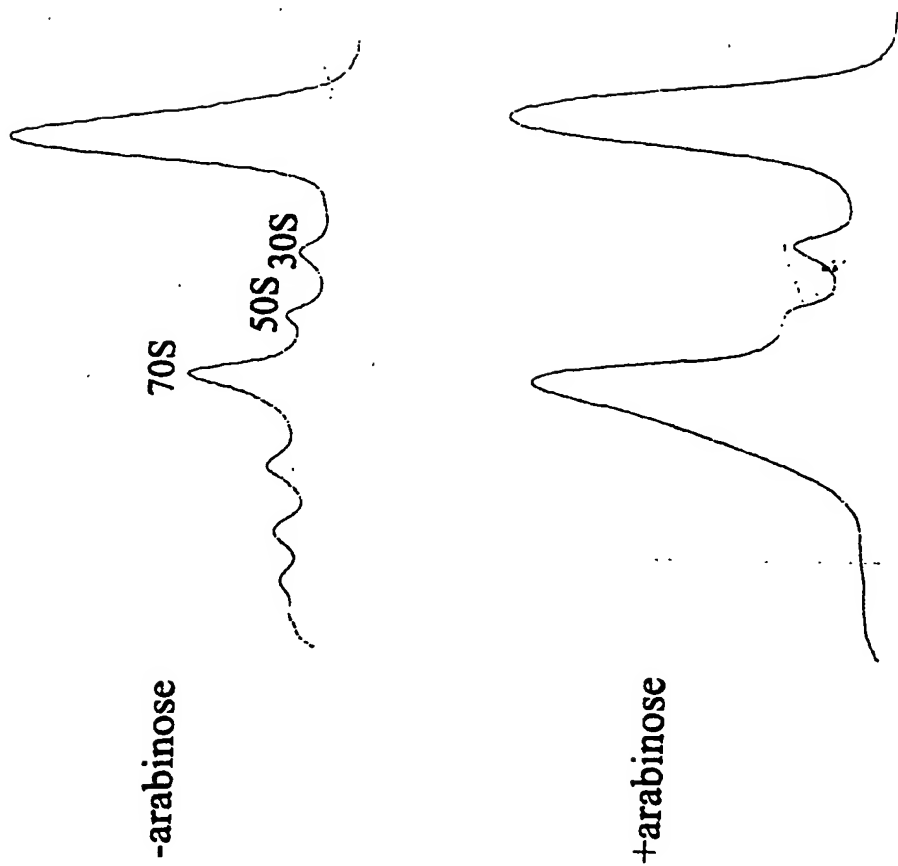
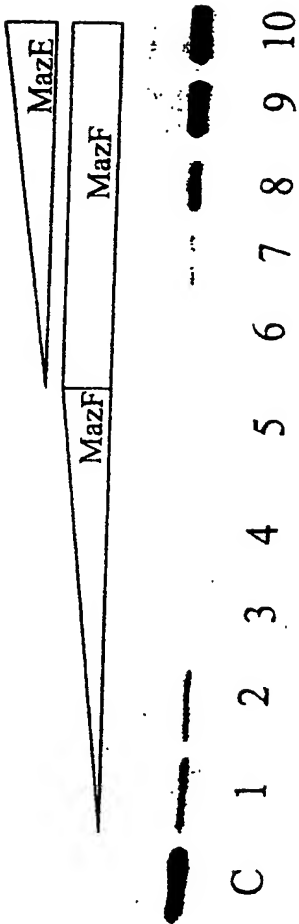


FIG. 3A

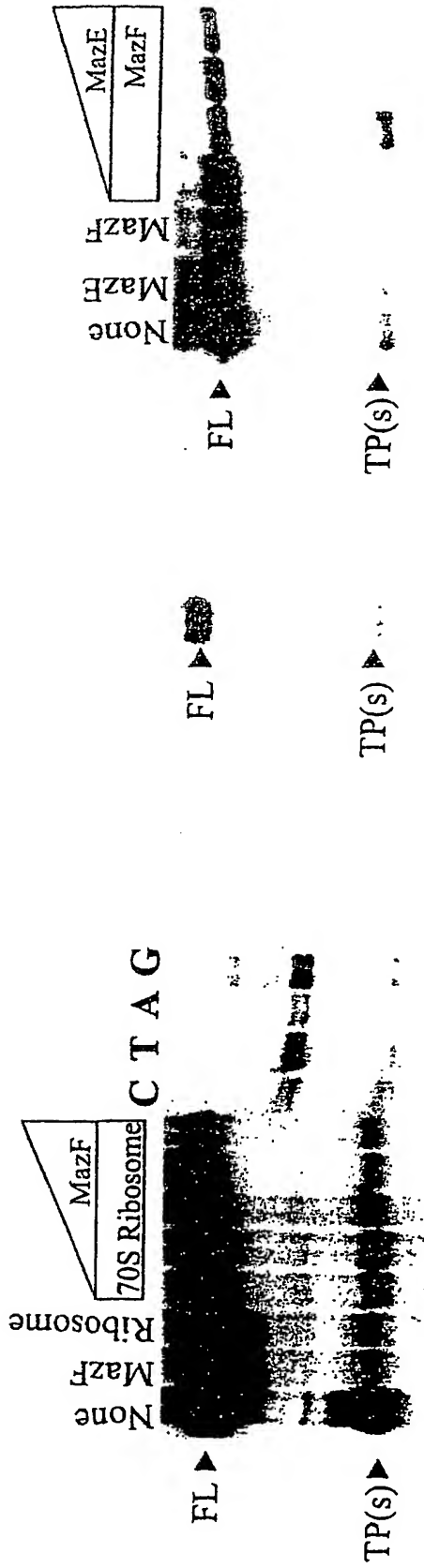
FIG. 3B



MazE	-	-	+
MazF	-	+	+



FIG. 3C



A
T
A
C
A
T
A
T
G

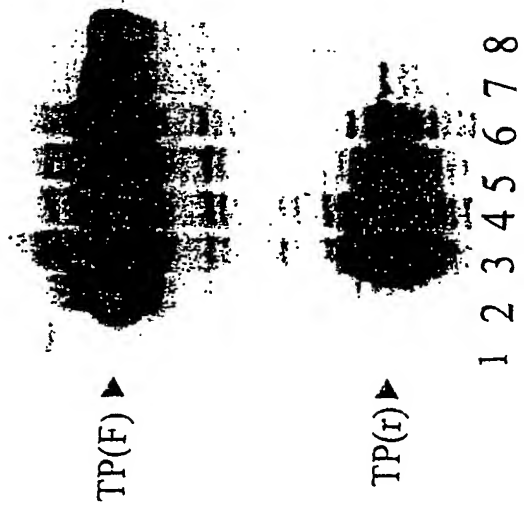
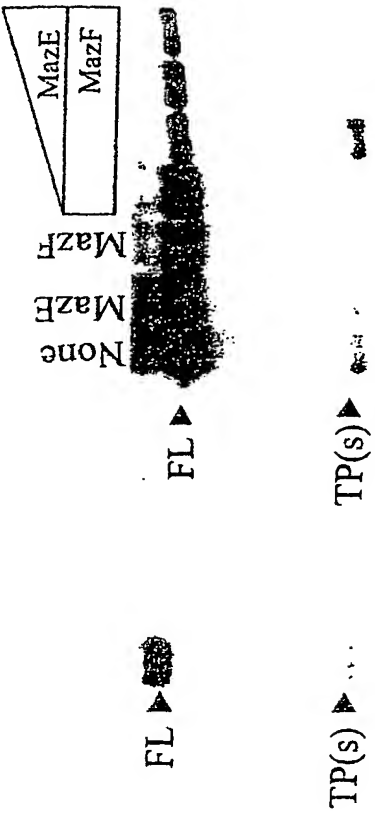


FIG. 4A



1 2 3 4 5 6 7

FIG. 4B

FIG. 4C

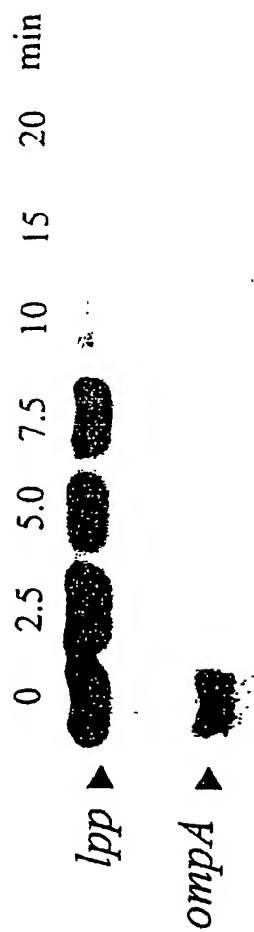


FIG. 4D

Control

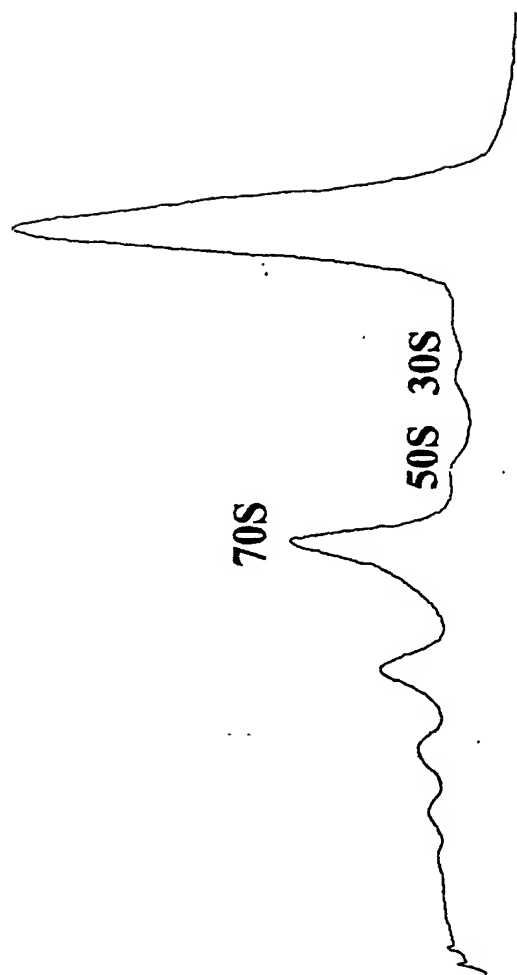


FIG. 5A

Kasugamycin (500 ug/ml)

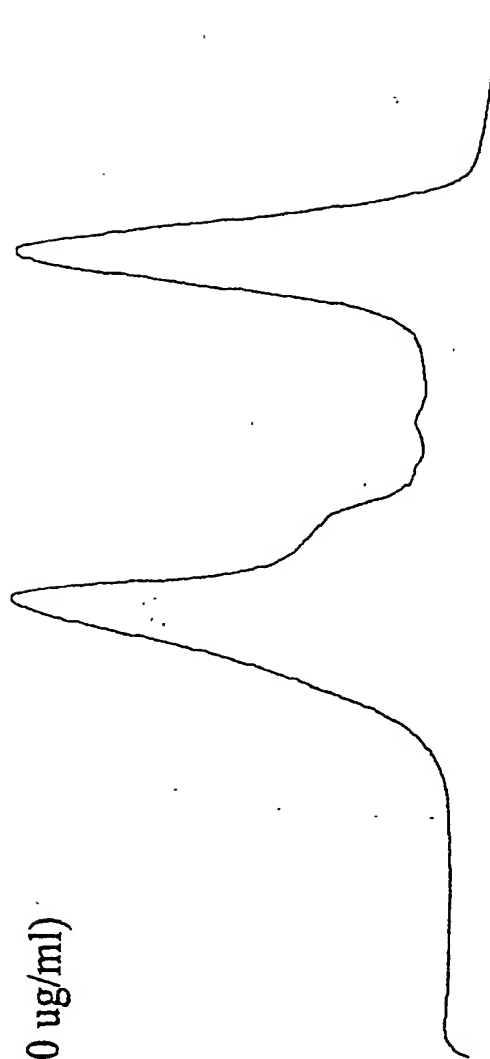


FIG. 5B

1 2 3 4 5 6

FL ▲

TP(s) ▲

TP(F) ▲

TP(r) ▲

FIG. 6

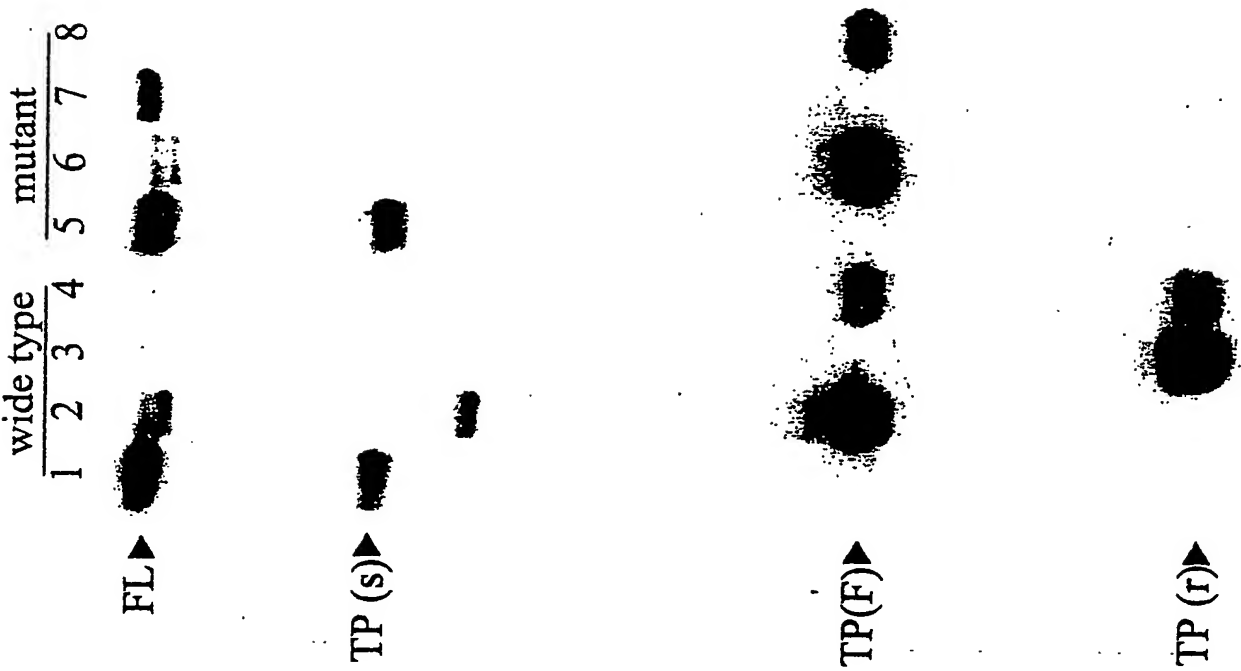


FIG. 7

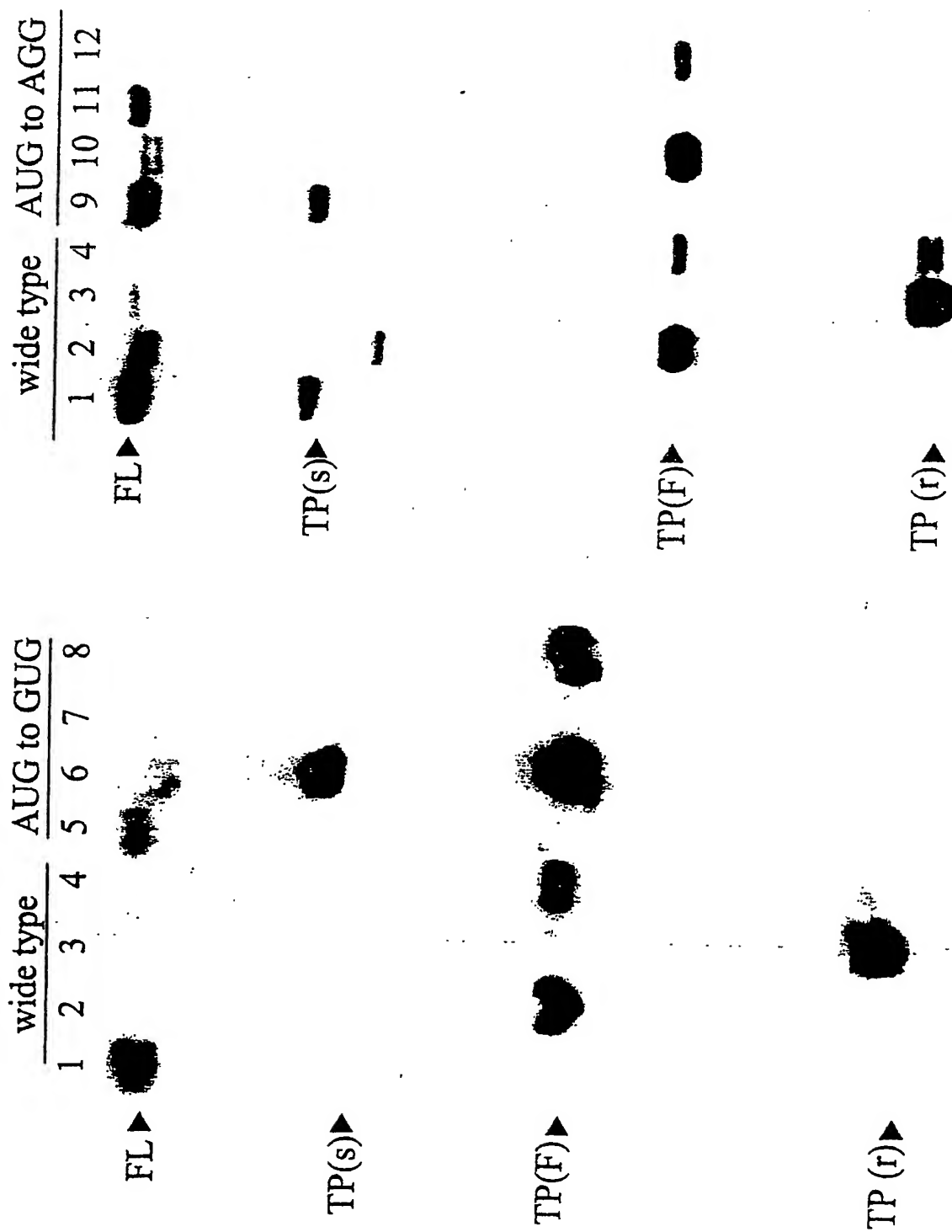


FIG. 8

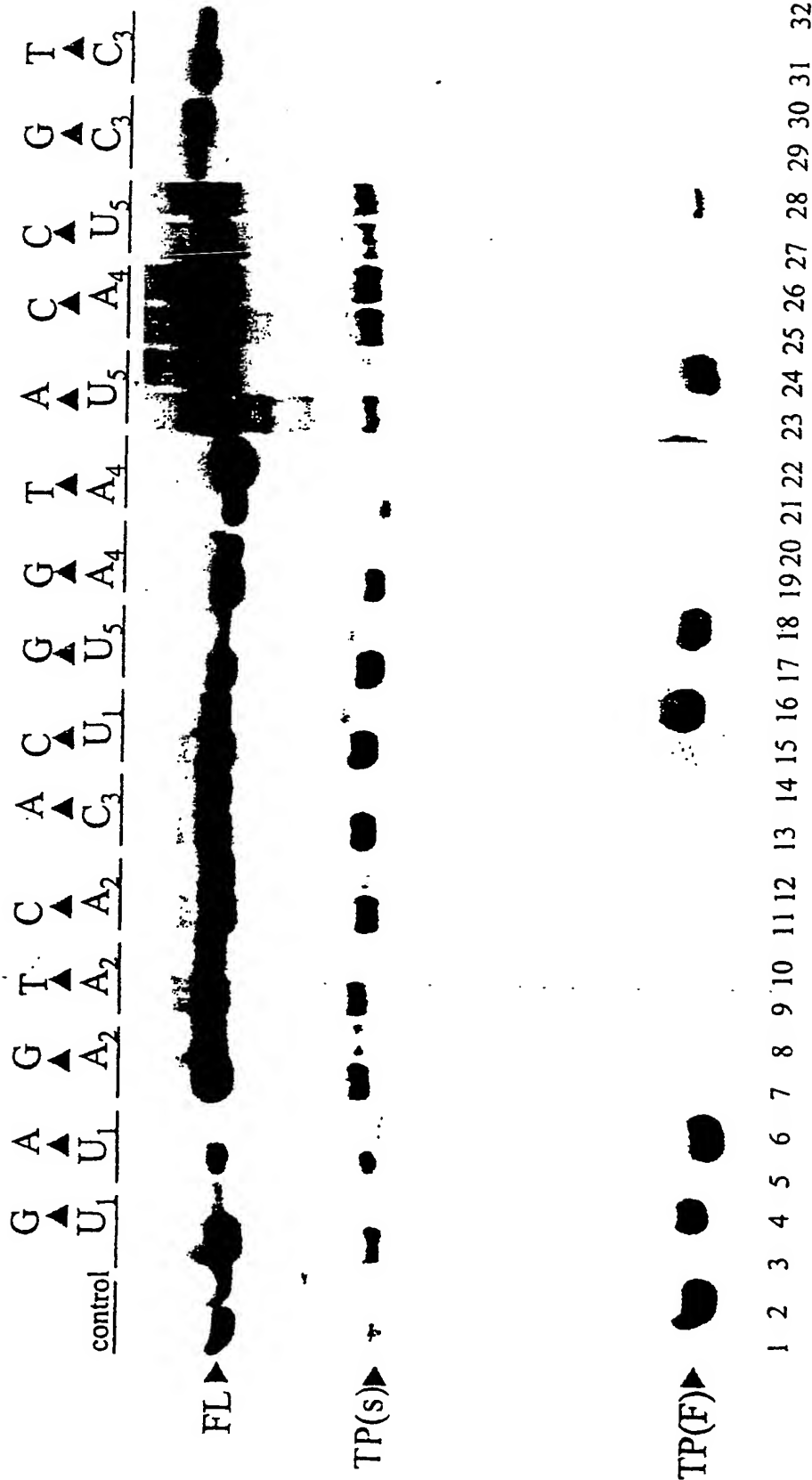


FIG. 9

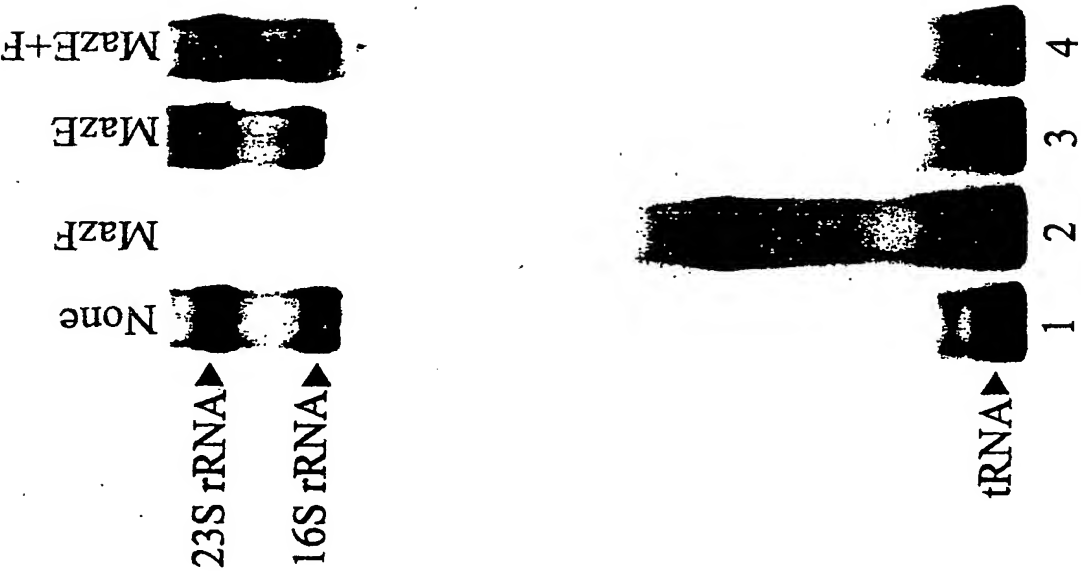


FIG. 10

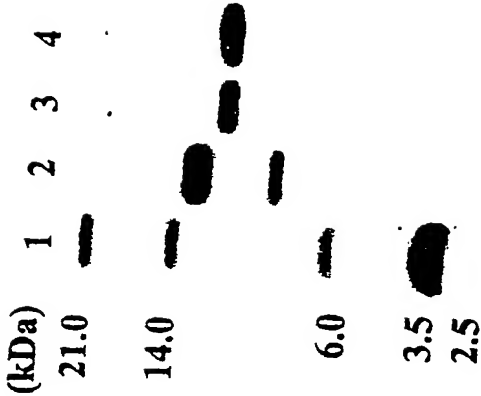
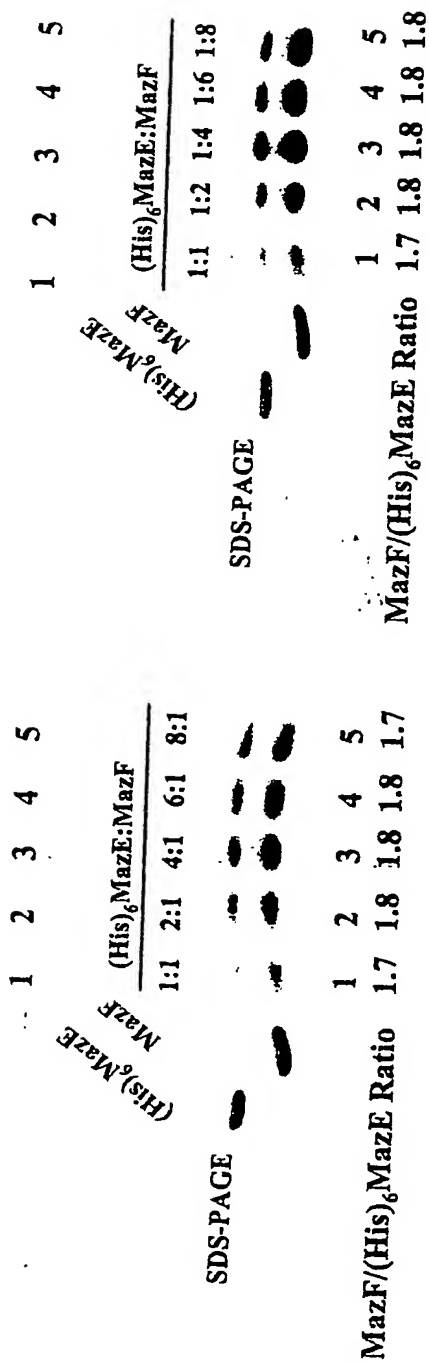
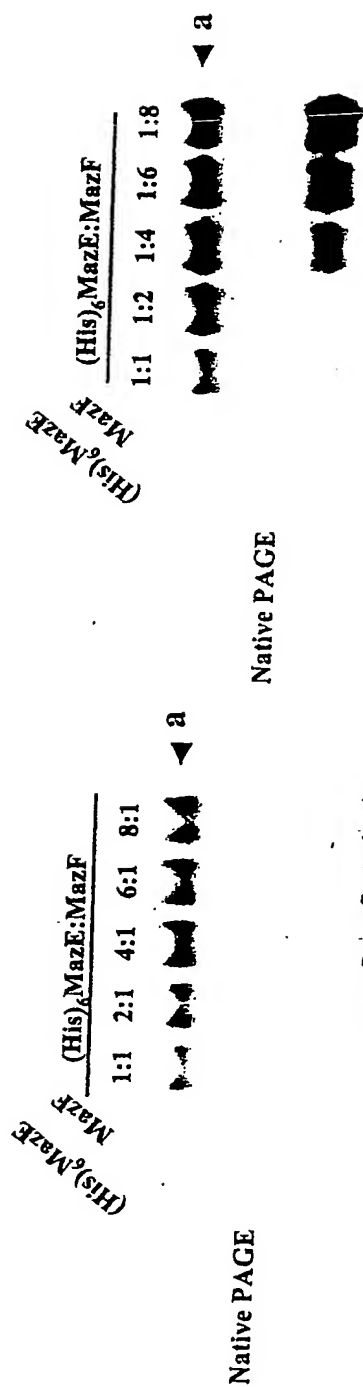


FIG. 11



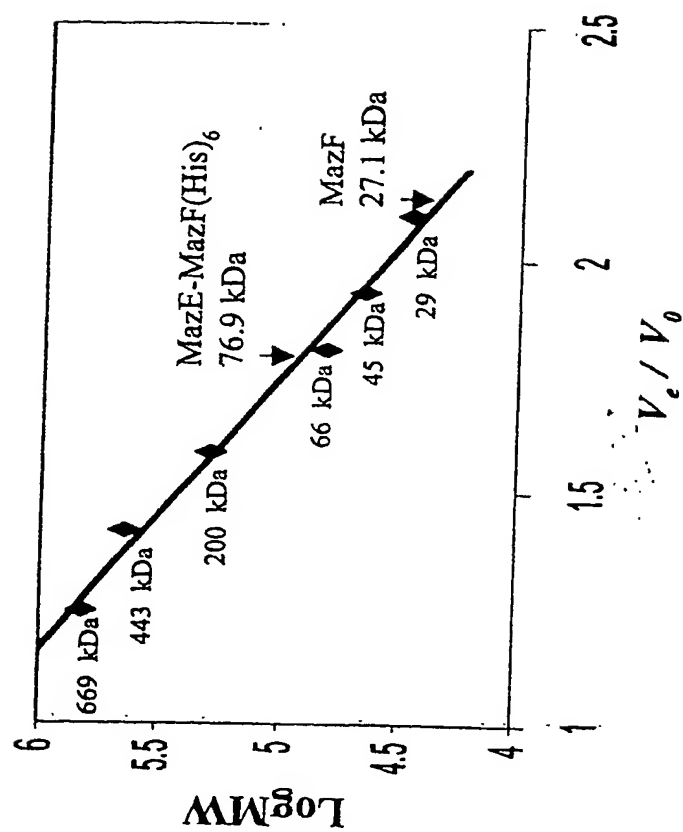


FIG. 13

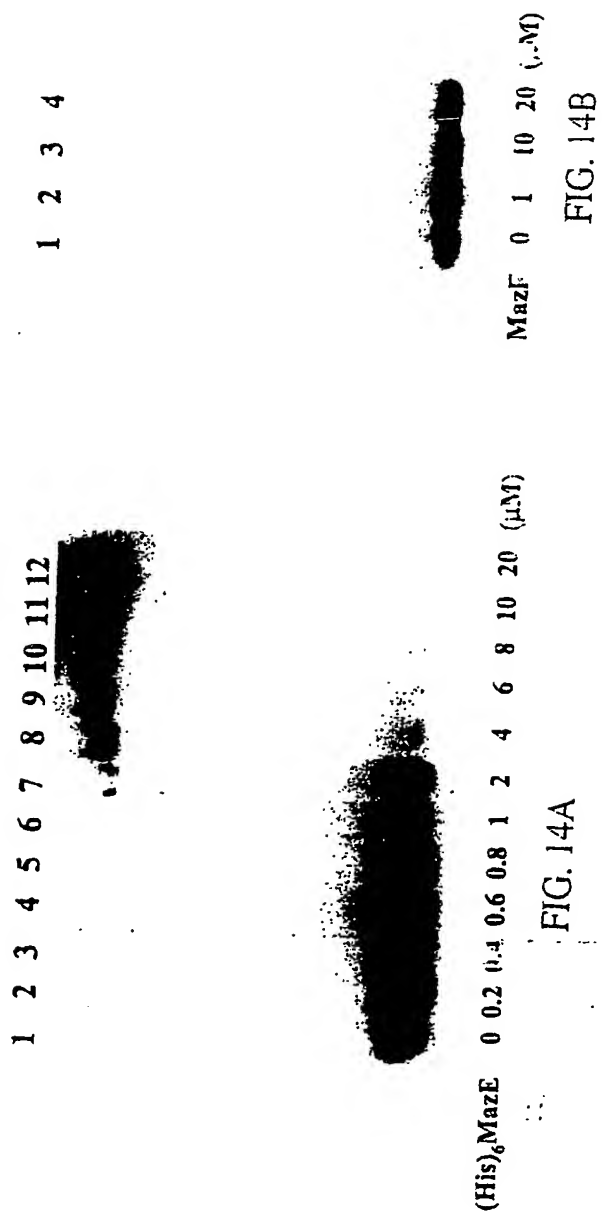


FIG. 14A

FIG. 14B

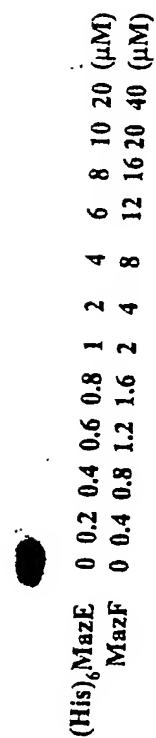


FIG. 14C

Maze_D.radiodurans	1	-----	MTSQIQKMGNSLALRIPKELIAQVGLTQSSVEVLLQS--DGQIVRR	
Maze_B.halodurans	1	-----	MTLMTTIQKMGNSLAVRPFNHYAKHINVTQGEIELSLG--SDQTIILK	
PemI_R100	1	-----	MHTTRLKPVGGSVMLTVPFALLNALSLGTDNEVGWIDNGRLIVEPYR	
PemI_R446b	1	MLYLNITFMEGKMH	TTRLKKVGGSVMLTVPFALLNALSLGTDNEVGWIDNGRLIVEPHR	
Maze_E.coli	1	-----	MIHSSVREAGHSPAVRFATLMQALNNIDDEMKIDLVDGKLIIEPVR	
ChpB_E.coli	1	-----	MQMRITTHNGHSA GMVFENIMKEINLQPGQSVQVSNQILITPIS	
Maze_P.putida	1	-----	MOIKIQQMGNSAAILRPAFVVKQMRGVGSTLSLDTTGETMVLKPVR	
Maze_P.profundum	1	-----	AMRTOIRIGNSIGS-II-ATFIRQLEL-EGAEIDMKT-DGKIVIEPI	
consensus	1		m stikrwgnsalalrip allq l l d ev lll liv pir	

N-Box

Maze_D.radiodurans	46	VPA-R-Q-DLAALLAEM-P	-----ENLGE-TDMGA---SREEW-
Maze_B.halodurans	48	K-K-R--KPLEELVAKIT-	-----ENRHE-IDFGR--T--ELL-
PemI_R100	49	R-P---QYSLAEALLAQCDPPNAEISAEEREWLDAPA--TGQEEI-	
PemI_R446b	61	R-P---QYSLAEALLAQCDPPNAEISAEEREWLDAPA--AGQEEI-	
Maze_E.coli	49	KEP---VFTLAELVNDITP	-----ENLHENIDNGE--PKDKEVW
ChpB_E.coli	50	P-----RYSLEALLAQCDMN---	AAELSEQDVWGKSTPACDEIW
Maze_P.putida	48	SKP---KYTLLEELMAQCCLLS---	APEPEDMADWAMRPVGREV-
Maze_P.profundum	44	-KMKKRFPFSRELLSGIDA-----	TAHAD-LVVISTQEL--E---
consensus	61	k p yslaellaqcdp	e re dw eei

Hp-Box

FIG. 15



FIG. 16A

FIG. 16B








	MazE fragments	Interaction with MazF
MazE	1  82	+
MazEΔ(1-13)	14  82	+
MazEΔ(1-24)	25  82	+
MazEΔ(1-37)	38  82	+
MazEΔ(1-46)	47  82	-
MazEΔ(76-82)	1  75	+
MazEΔ(68-82)	1  67	-

FIG. 17

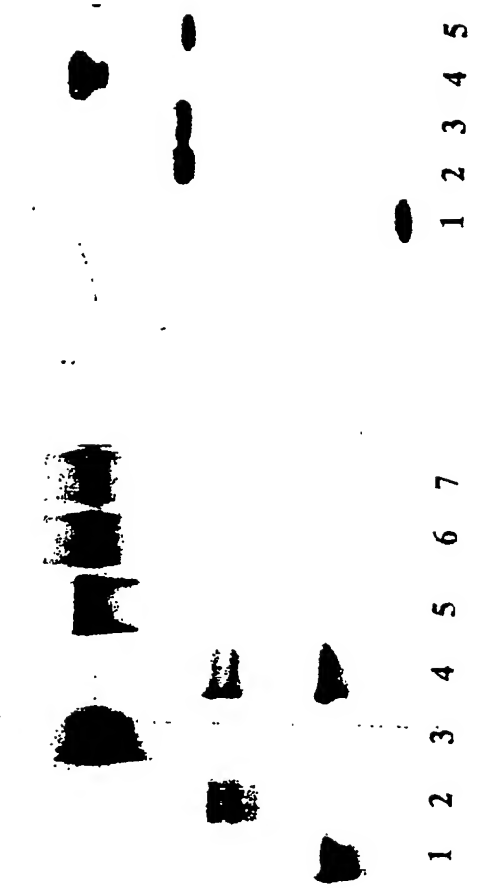


FIG. 18A

FIG. 18B

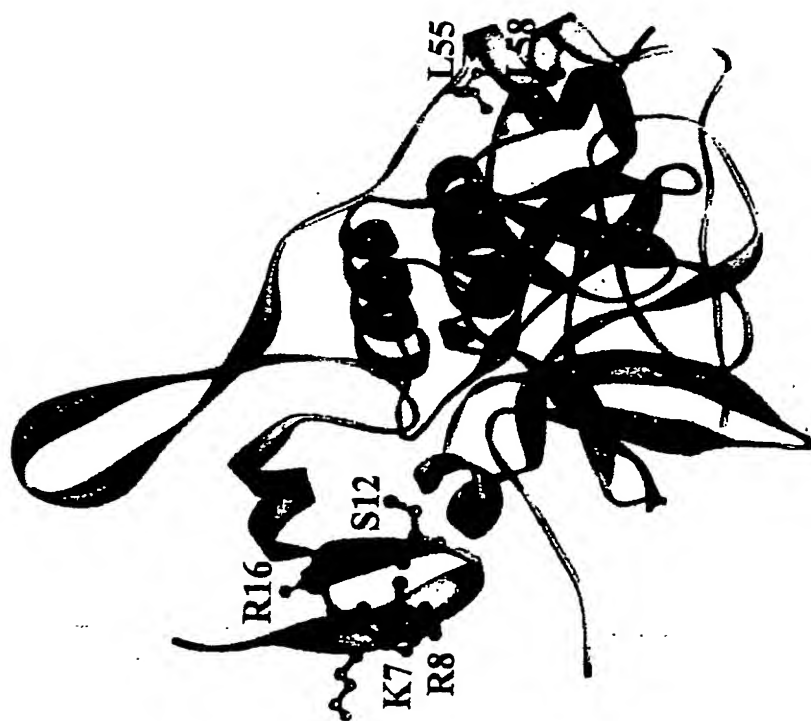


FIG. 19

FIG. 20A

Nucleic acid sequence of *Escherichia coli* MazF gene
(NP_289336.1)

atggta agccgatacg taccgatat gggcgatctg atttgggtg atttgaccc gacaaaaggt agcgagcaag
ctggacatcg tccagctgtt gtcctgagtc cttcatgta caacaacaaa acaggtatgt gtctgtgtgt tccttgata
acgcaatcaa aaggatatcc gttcgaagti gttttatccg gtcaggaacg tgatggcgta gcgttagctg atcaggtaaa
aagtatgcc tggcgggcaa gaggagcaac gaagaaagga acagttgcc cagaggaatt acaactcatt
aaagccaaaa ttaactact gattgggtag

FIG. 20B

Amino acid sequence of *Escherichia coli* MazF protein
(NP_289336.1)

MVSRYPDMG DLIWVDFDPT KGSEQAGHRP AVVLSPFMYN NKTGMCLCVP
CTTQSKGYPF EVVLSGQERD GVALADQVKS IAWRARGATK KGTVAPEELQ
LIKAKINVLI G

FIG. 21A

Nucleic acid sequence of *Escherichia coli* MazE gene

```
atgatccacagtagcgtaaagcggttgggggaaattcacccggcggtgcggatccccggctacgttaatgcaggcg  
ctcaatctgaatattgatgatgaagtgaagattgacctgggtggatggcaaattaattattgagccagtgcg  
aaagagcccgtatattacgcttgctgaactggtcaacgacatcacgccgaaaacctccacgagaatatcgac  
tggggagagccgaaagataaggaagtctggtaa
```

FIG. 21B

Amino acid sequence of *Escherichia coli* MazE protein

```
MIHSSVKRWGN SPAVRIPATLMQALNLNIDDEVKIDLVDGKLIIEPVRKEPVFTLAE LVN  
DITPENLHENIDWGE PKDKEVW
```

FIG. 22A: Nucleic acid sequence of *Bacillus halodurans* MazF gene (SEQ ID NO: 39)

```
atgccagtagc cggatagagg gaatcttggt tatgtagact ttaaccacac atcgggtcat
gaccaagccg ggacacgacc ggctattggt ttgtccccta aattatttaa taaaaacaca
ggttttgcgg tggtttgctc aattaccaga caacaaaaag gttatccttt tgaaatagaa
ataccaccgg ggttacctat tgaaggggtt attcttactg accaagtaaa aagtctggat
tggagagcaa gaaactttca cattaagga caagcaccag aggaaactgt tactgattgt
ttacaactta ttcatacatt tttatcttaa
```

FIG. 22B: Nucleic acid sequence of *Staphylococcus epidermidis* MazF gene (SEQ ID NO: 40)

```
atgattagaag aggagatggt tatttagcgg atttatcacc agttcaaggg tctgaacaag
ggggagtaga acctgtagtt atcattcaaa atgatactgg taataaatat agtccaactg
taattgtagc tgcgattact gatgggatta ataaagcgaa aataccaacc cacgtagaaa
ttgaaaagaa aaagtataaa ttagacaaag attcagttat tcttcttgaa caaattagaa
cactagataa aaagcgttta aaagaaaaat taacattttt atcagagagt aaaatgatag
aggttgataa tgccttagat attagtttgg gattaaataa ctttgatcat cataaatcttaa
```

FIG. 22C: Nucleic acid sequence of *Staphylococcus aureus* MazF gene (SEQ ID NO: 41)

```
atgattagac gaggagatgt ttatttagca gatttatcac cagtacaggg atctgaacaa
gggggagtaga gacctgtagt cataattcaa aatgatactg gtaataaata tagtcctaca
gttattgttg cggcaataac tggtaggatt aataaagcga aaataccgac acatgtagag
attgaaaaga aaaagtataa gttggataaa gactcagtta tattattaga acaaattcgt
acacttgata aaaaacgatt gaaagaaaaa ctgacgtact tatccgatga taaaatgaaa
gaagtagata atgcactaat gattagttta gggctgaatg cagttagtca accagaaaaa
ttaggcgtct atttatatgta tttttcagag ataaataaaa tattgatataa
```

FIG. 22D: Nucleic acid sequence of *Bacillus subtilis* MazF gene (SEQ ID NO: 42)

```
ttgatttgtaa acgcggcgat gtttattttg ctgatttatc tctgtttggt ggctcagagc
aaggcggggt gcgcccgggt ttagtgatoc aaaatgacat cggaaatcgc ttcagcccaa
ctgctattgt tgcagccata acagcacaaa tacagaaagc gaaattacca acccacgtcg
aaatcgatgc aaaacgctac ggttttgaaa gagattccgt tattttgctg gagcaaattc
ggacgattga caagcaaagg ttaacggata agattactca tctggatgat gaaatgatgg
ataagggtga tgaagcctta caaatcagtt tggcactcat tgatttttag
```

FIG. 22E: Nucleic acid sequence of *Neisseria meningitides* MC58 MazF gene (SEQ ID NO: 43)

```
atggat atggtagtagc gcggcggaat ctatctgggt tccttagacc cgaccgtagg aagcgaaatc
aaaaagacac gtccttggtt cgtagtctct cctcctgaaa tacacaacta tctcaagact
gtgctgatcg ttcccatgac gagcggaagc cgtcctgccc cgttccgcgt caatgtccgc
tttcaggata aagacggttt gcttttgccc gaacagatta gggctgtgga taaagccgga
ttggtcaaac atcttggcaa ttagacaac agtacggctg aaaaactggt tgcagtattg
caggagatgt ttgcctga
```

FIG. 22F: Nucleic acid sequence of *Morganella morganii* MazF gene (SEQ ID NO: 44)

atgcgcccgg cggctggtca ggaggaaatc tgacatggaa agagggggaaa tctggcttgt
ctcgcttgac cctaccgcag gtcattgagca gcagggaacg cggccggtac tgattgtcac
gccggctgct tttaaccgcg tgaccgcgct gcctgttgtt gtgcccgtga ccagcggagg
taattttgcc cgcacagcag gctttgctgt gtcgcttgac ggcgccggca tacgtaccac
cggcggttgtg cggtgcgac aaccccggaac gatcgatatg aaagcccgcg gcggcaaacg
actcgaacgg gtgcagaga ctatcatgga cgacgttctt ggccgtcttg ccaccatcct
gacctga

FIG. 22G: Nucleic acid sequence of *Mycobacterium tuberculosis* MazF gene (SEQ ID NO: 45)

gtggtgattc ggggagcggc ctacagggtc gacttcggcg atgcgaagcg aggccacgag
caacgcgggc ggcgctacgc cgtggtcacg agccccggct cgatgccgtg gagtgtagta
accgtggtgc cgacgtcgac aagcgcccaa cctgcggttt tccgaccaga gctggaagtc
atgggaacaa agacacggtt cctggtggat cagatccgga cgatcggcat cgtctatgtg
cacggcgatc cggtcgacta tctggaccgt gaccaaattg ccaagggtga acacgccgtg
gcacgatacc ttggtctgtga

FIG. 22H: Nucleic acid sequence of *Bacillus anthracis* MazF gene (SEQ ID NO: 79)

tt gattgtaaaa cgcggcgacg tgtattttgc agacctttcc ccagttgttg
gttctgagca aggaggtgtt cgtccggttc ttgtcattca aaatgacatc ggaaatcgtt
ttagtccaac ggtgattgta gcggctatta ctgcacagat tcaaaaagcg aaattacca
ctcatgtgga aattgatgcg aaaaagtacg gttttgagag agattctgtt attttacttg
agcagattcg aacaatcgat aagcagcgct taacggacaa aatcactcac ttagatgaag
tgatgatgat tcgtgtagat gaagcgctac aaattagttt aggactaata gatttttaa

FIG. 23A: Amino acid sequence of *Bacillus halodurans* MazF
(NP_244588.1) (SEQ ID NO: 46)

MPVPDRGNLV YVDFNPQSGH DQAGTRPAIV LSPKLFNKNT GFAVVCPITR QQKGYPFEIE
IPFGLPIEGV ILTDQVKSLD WRARNFHIKG QAPEETVTDC LQLIHTFLS

FIG. 23B: Amino acid sequence of *Staphylococcus epidermidis*
MazF (AAG23809.1) (SEQ ID NO: 47)

MIRRGDVYLA DLSPVQGSEQ GGVRPVVIIQ NDTGNKYSPT VIVAAITDGI NKAKIPTHVE
IEKKKYKLDK DSVILLEQIR TLDKKRLKEK LTFLSESKMI EVDNALDISL GLNNFDHHS

FIG. 23C: Amino acid sequence of *Staphylococcus aureus* MazF
(NP_372592.1) (SEQ ID NO: 48)

MIRRGDVYLA DLSPVQGSEQ GGVRPVVIIQ NDTGNKYSPT VIVAAITGRI NKAKIPTHVE
IEKKKYKLDK DSVILLEQIR TLDKKRLKEK LTYLSDDKMK EVDNALMISL GLNAVAQPEK
LGVYYMYFSE INKILI

FIG. 23D: Amino acid sequence of *Bacillus subtilis* (1NE8_A)
MazF (SEQ ID NO: 49)

MIVKRGDVYF ADLSPVVGSE QGGVRPVLVI QNDIGNRFSP TAIVAAITAQ IQKAKLPHTV
EIDAKRYGFE RDSVILLEQI RTIDKQRLTD KITHLDDEMM DKVDEALQIS LALIDF

FIG. 23E: Amino acid sequence of *Neisseria meningitides*
MC58 MazF (NP_266040.1) (SEQ ID NO: 50)

MYIPDKGDIF HLNFPSSGK EIKGGRFALA LSPKAFNRAT GLVFACPIQ GNAAAARSSG
MISTLLGAGT ETQGNVHCHQ LKSLDWQIRK ASFKETVPDY VLDDVLARIG AVLFD

FIG. 23F: Amino acid sequence of *Morganella morganii* MazF
(AAC82516.1) (SEQ ID NO: 51)

MRRRLVRRKS DMERGEIWL V SLDPTAGHEQ QGTRPVLIVT PAAFNRVTRL FVVVPVTS GG
NFARTAGFAV SLDGAGIRTT GVVRCDQPR T IDMKARGGKR LERVPETIMD DVLGRLATILT

FIG. 23G: Amino acid sequence of *Mycobacterium tuberculosis*
MazF (NP_217317.1) (SEQ ID NO: 52)

MMRRGEIWQV DLDPARGSEA NNQRPAVVVS NDRANATATR LGRGVITVVP VTSNIAKVYP
FQVLLSATTT GLQVDCKAQA EQIRSIATER LLRPIGRVSA AELAQLDEAL KLHLDLWS

FIG. 23H: Amino acid sequence of *Bacillus anthracis* MazF
(NP 842807) (SEQ ID NO: 80)

MIVKRGDVYF ADLSPVVGSE QGGVRFVLVI QNDIGNRFSP TVIVAATAQ IQKAKLPTHV
EIDAKKYGFE RDSVILLEQI RTIDKQRLTD KITHLDEVMM IRVDEALQIS LGLIDF

FIG. 24A: Nucleic acid sequence of *Deinococcus radiodurans mazE* gene (SEQ ID NO: 53)

atgacgagtcaaattcagaaatggggcaacagcctcgcgctccgcattcccaaagctctggcgagcaggtg
ggactgacgcagagttcagaagtggagctgcttcttcaggacgggtcagattgtcatccggccagttcctgct
cggcagtagcatctcgccgctgctggccgaaatgacacctgaaaatctgcatggggaaacagactggggc
gactggaaggacgcgaggaatggttaa

FIG. 24B: Nucleic acid sequence of *Bacillus halodurans mazE* gene (SEQ ID NO: 54)

gtgacactcatgactactatacaaaagtggggaaatagtttagctgttcgtattccgaaccattatgctaaa
catattaacgttacgcaaggatctgaaattgaactaagcttagggagtgatcaaacgattattttaaagcct
aaaaaagaaagccaacattagaggaattagtgggcaaaaatcactcctgaaaacagacataacgaaattgat
ttcgggagaacaggaaaggaattgttgttaa

FIG. 24C: Nucleic acid sequence of Plasmid R100 *pemI* gene (SEQ ID NO: 55)

atgcataccacccgactgaagaggggttggcgggtcagttatgctgaccgtcccaccggcactgctgaatgcg
ctgtctctgggcacagataatgaagttggcatgggtcattgataatggccggctgattgttgagccgtacaga
cgcccgcaatattcactggctgagctactggcacagtgtgatccgaatgctgaaatatcagctgaagaacga
gaatggctggatgcaccggcgactgggtcaggaggaaatctga

FIG. 24D: Nucleic acid sequence of Plasmid R466b *pemI* gene (SEQ ID NO: 56)

atgttatatttaaatataactttttatggaggggaaaaatgcataccactcgactgaagaagggttggcgggtca
gtcatgctgaccgtcccaccggcactgctgaatgcgctgtcgctgggtacagataatgaagttggcatgggtc
attgataatggccggctgattgtggagccgcacagacgcccgcagtattcactggctgagctgttggcacag
tgcatccgaacgctgaaatctcggcagaagaacgtgaatggctggatgcgcggcggtggtcaggaggaa
atctga

FIG. 24E: Nucleic acid sequence of *Escherichia coli chps* gene (SEQ ID NO: 57)

gtgcagatgcgtattaccataaaaagatgggggaacagtgaggtatgggtcattcccaatatcgtaatgaaa
gaacttaacttacagccggggcagagcgtggaagtgcaggtgagcaacaaccaactgattctgacacccatc
tccaggcgctactcgcttgatgaactgctggcacagtgtgacatgaacgccggaacttagcgagcaggat
gtctggggtaaattcaccctcggggtgacgaaatatggttaa

FIG. 24F: Nucleic acid sequence of *Pseudomonas putida* KT2440 *mazE* gene (SEQ ID NO: 58)

atgcagatcaagattcaacagtggggcaacagcgccgcgatccgcttgcccgcgcagtagtcaagcagatg
cgctcgggtgctgggtccaccctgagccttgacacaacgggtgagacgatgggtgctcaaaccgctcaggtcg
aaaccgaagtacacccttgaggaactgatggccagtggtgacctgagtgaccggagccagaggacatggcc
gactggaatgccatgcgccagtgggcggtgaagtgtga

FIG. 24G: Nucleic acid sequence of *Photobacterium profundum mazE* gene (SEQ ID NO: 59)

gtgcaatgagaactcagataagaaagatcggttaactcacttgggttcaattattcctgccactttttattcgctc
agcttgaactggcagagggcgagaaattgatgtttaaaccgggttgatggaaaaattgtgattgagccaatta
gaaaaatgaaaaaacgtttccattcagtgagcgtgaattactaagtggattggatgcacacactgctcatg
ctgacgaactgggtgttaatttctaccaggagctaggcgaataa

FIG. 25A: Amino acid sequence of *Deinococcus radiodurans* Maze (GenBank Accession No. NP_294139) (SEQ ID NO: 60)

MTSQIQKWGN SLALRIPKAL AQQVGLTQSS EVELLQDGQ IVIRPVPARQ YDLAALLAEM
TPENLHGETD WGALEGREEW

FIG. 25B: Amino acid sequence of *Bacillus halodurans* Maze (GenBank Accession No. NP_244587) (SEQ ID NO: 61)

MTLMTTIQKW GNSLAVRIPN HYAKHINVTD GSEIELSLGS DQTIILKPKK RKPTLEELVA
KITPENRHNE IDFGRTGKEL L

FIG. 25C: Amino acid sequence of PemI plasmid R100 (GenBank Accession No. NP_052993) (SEQ ID NO: 62)

MHTTRLKRVG GSVMLTVPPA LLNALSLGTD NEVGMVIDNG RLIVEPYRRP QYSLAELLAQ
CDPNAEISAE EREWLDAPAT QQEET

FIG. 25D: Amino acid sequence of PemI plasmid R466b (GenBank Accession No. AAC82515) (SEQ ID NO: 63)

MLYLNITFME GKMHTTRLKK VGGSVMLTVP PALLNALSLG TDNEVGMVID NGRLIVEPHR
RPQYSLAELL AQCDPNAEIS AEEREWLDAP AAGQEET

FIG. 25E: Amino acid sequence of *Escherichia coli* ChpS (GenBank Accession No. NP_290856) (SEQ ID NO: 64)

MQMRITIKRW GNSAGMVIPN IVMKELNLQP GQSVEAQVSN NQLILTPISR RYSLDELLAQ
CDMNAAELSE QDVWGKSTPA GDEIW

FIG. 25F: Amino acid sequence of *Pseudomonas putida* Maze KT2440 (GenBank Accession No. NP_742931) (SEQ ID NO: 65)

MQIKIQQWGN SAAIRLPAAV LKQMR LGVGS TLSLDTTGET MVLKPVRSKP KYTLEELMAQ
CDLSAPEPED MADWNAMRPV GREV

FIG. 25G: Amino acid sequence of *Photobacterium profundum* Maze (GenBank Accession No. AAG34554) (SEQ ID NO: 66)

AMRTQIRKIG NSLGSIIPAT FIRQLELAEG AEIDVKTVDG KIVIEPIRKM KKRFPFSERE
LLSGLDAHTA HADELVVIST QELGE

FIG. 26A

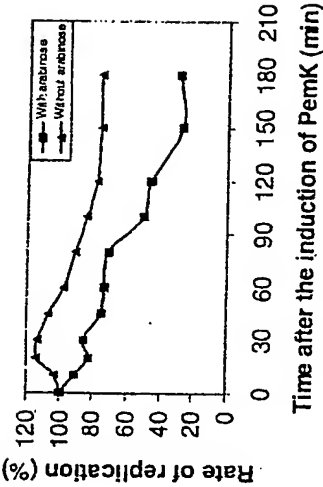


FIG. 26B

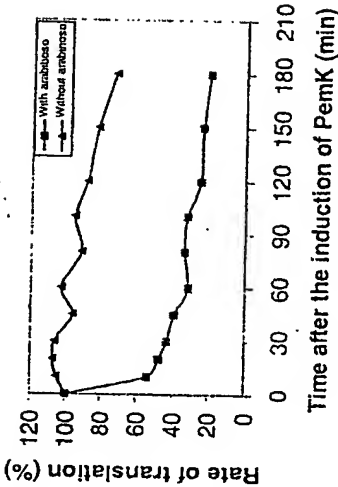


FIG. 26C

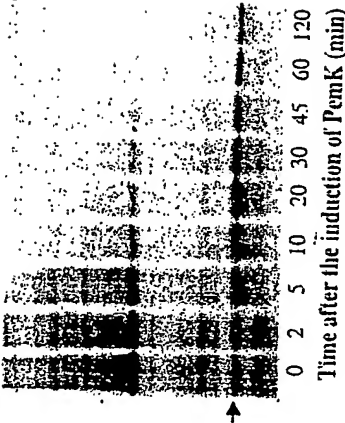


FIG. 27A



FIG. 27B

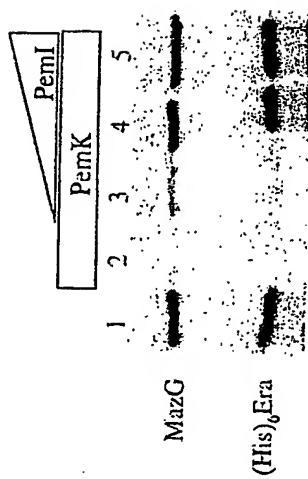


FIG. 27C

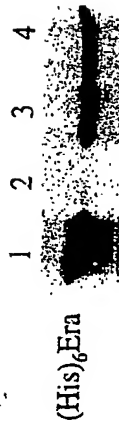


FIG. 28A



FIG. 28B

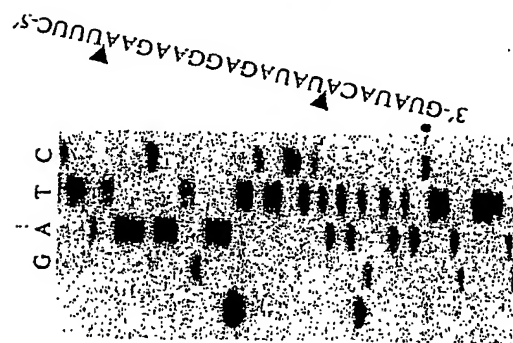


FIG. 28C

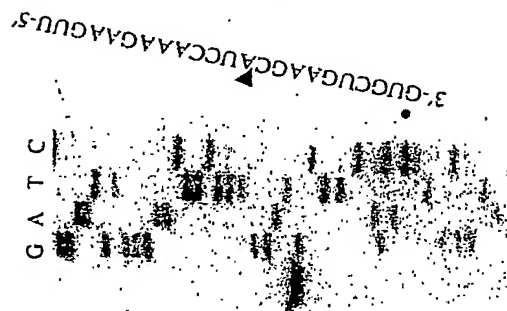


FIG. 28D

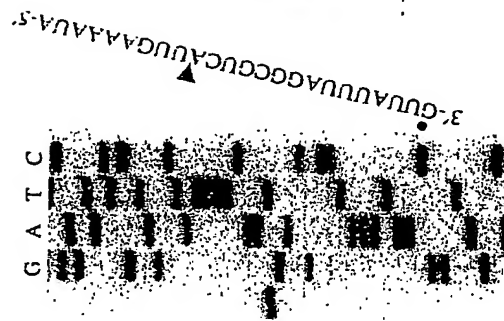


FIG. 28E

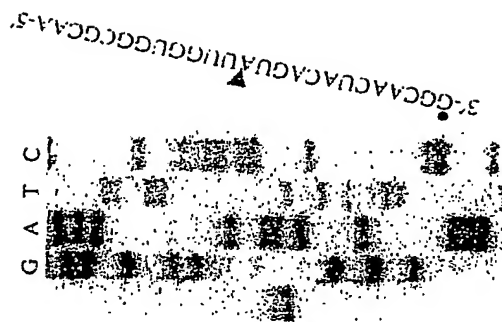


FIG. 29A

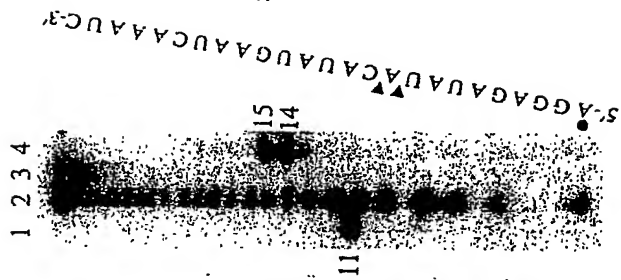


FIG. 29B

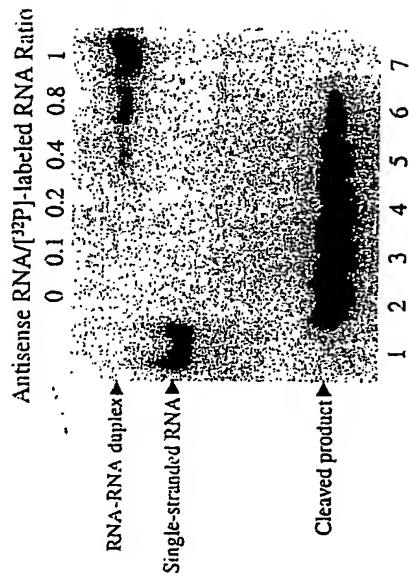


FIG. 30A

FIG. 30B

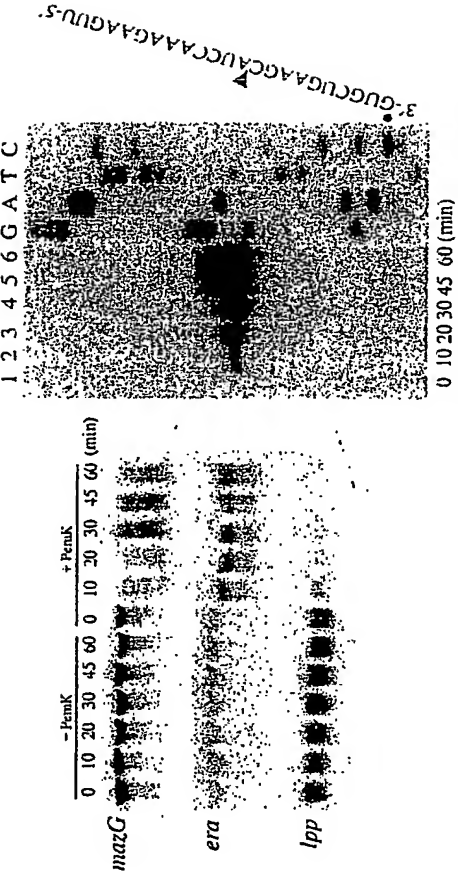
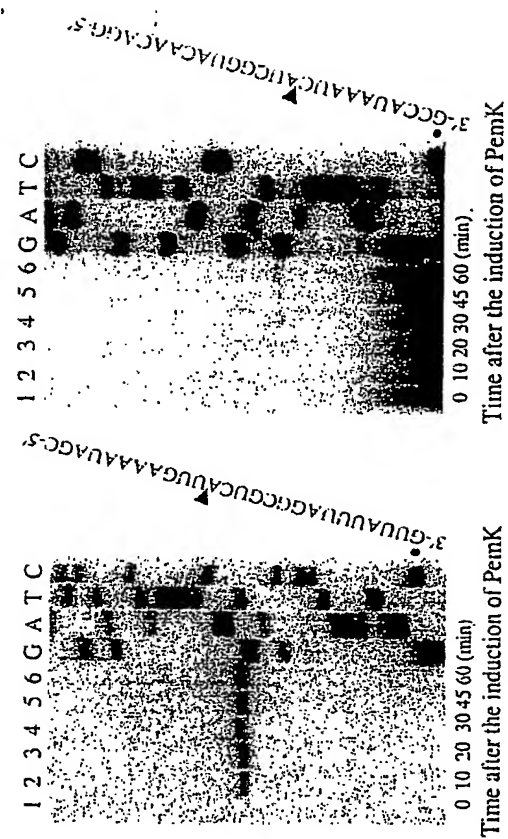


FIG. 30C

FIG. 30D



```
atggaaagag gggaaatctg gcttgtctcg cttgataccta
ccgcaggtca tgagcagcag ggaacgcggc cggtgctgat
tgtcacaccg gcggccttta atcgcgtgac ccgcctgcct
gttgttgtgc ccgtaaccag cggaggcaat tttgcccgcga
ctgccggcct tgcggtgtcg ttggatgggtg ttggcatacgc
taccacaggt gttgtacgtt gcgatcaacc ccggacaatt
gatatgaaag cacggggcgg aaaacgactc gaacgggttc
cggagactat catgaacgaa gttcttggcc gcctgtccac
tattctgact tga
```

FIG. 31A

```
MERGEIWLVS LDPTAGHEQ QGTRPVLIVT PAAFNRVTRL
PVVVPVTSGG NFARTAGFAV SLDGVGIRTT GVVRCDQPRT
IDMKARGGKR LERVPETIMN EVLGRLSTILT
```

FIG. 31B

atgcatacca cccgactgaa gaggggttggc ggctcagtta
tgctgaccgt cccaccggca ctgctgaatg cgctgtctct
gggcacagat aatgaagttg gcatgggtcat tgataatggc
cggctgattg ttgagccgta cagacgcccg caatattcac
tggctgagct actggcacag tgtgatccga atgctgaaat
atcagctgaa gaacgagaaat ggctggatgc accggcgact
ggtcaggagg aaatctga

FIG. 32A

MHTTRLKRVG GSVMLTVPPA LLNALSLGTD NEVGMVIDNG
RLIVEPYRRP GYSLAELLAQ CDPNAEISAE EREWLDAPAT
GQEEI

FIG. 32B

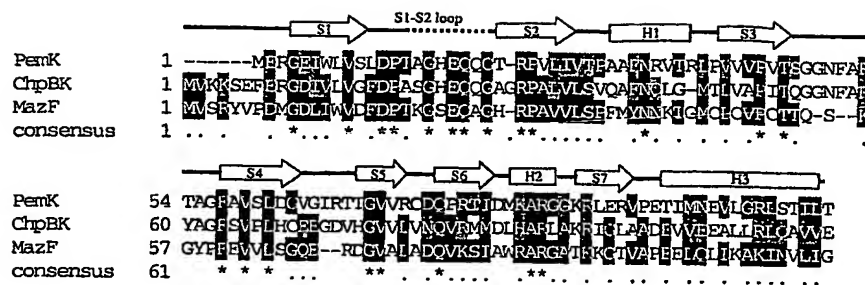


FIG. 33

```

PemKR100_E.coli 1 -----MERGEIWNVSLDPTAGHEQQG-TRFVLIVTPPAFNRVTRLPVVMPTSGGNFARTAGFAVSLDGVGIRT---TG
PemK_M.celatum 1 -----MTERGDIYLVSLDPTSGHEQSG-TRFVLVVSFGAENRLTKTPVVEPTTRGGNFARTAGFAVSLTDAGTRT---AG
PemK_P.putida 1 -MKRLKFARGDIVRVNLDPTVGREQQQSGRFPALVLTTPAFN-ASGLAVIIPITGGDFARHAGFAVTLSGAGTQT---QG
ChpBK_E.coli 1 MVKKESEFERGDIYLVGFDEASGHEQQGAGRPALVLSVOAFN-QLGMLVAPITGGNFARYAGFSVPLHCEEVDV---HG
PemK_S.flexneri 1 MVKARTPHRGEIWFENPDVAGHELQG-PHYCLVVTDDKLNVLKVAMCCPISTGANAARSTGVTVNVLPRDTOTGNLHG
MazF_E.coli 1 MVSRYVPMGDLIWNDFDPTKGEQAG-HRPAVVLSEPFMYNNKTGMCLVPCITQ-----SKGYPFVVLSSQER---DG

```

```

PemKR100_E.coli 71 VVRCDOPTIIDMKARGGKRIHERVPETIMNEVLGRLSITL--
PemK_M.celatum 72 VVRCDOPTSIDLRARKGRKVERVPSGVLDEALAKLATILT--
PemK_P.putida 76 VVLCNQVRTVDLEARFAKRTEVSPEAVILDALARVOTLFD--
ChpBK_E.coli 77 VVLVNQVRMDLHARLAKRTGLAADEVVEALLRLQAVVE--
PemK_S.flexneri 80 VVLCHQLKAVDLIARGAKFHTVADEKLTSEVTSKLVNLTDPQ
MazF_E.coli 72 VALADQVKSIAMRARGATKKGTVAPEELQLIKAKTNVLIG--

```

FIG. 34

Human Eotaxin Sequence

G P A S V P T T C C F N L A
 AUG GGU CCA GCA UCU GUU CCG ACU ACC UGU UGC UUU AAC CUG GCG

 N R K I P L Q R L E S Y R R I
 AAC CGC AAA AUU CCG CUG CAG CGC CUG GAA AGC UAU CGC CGU AUU

 T S G K C P Q K A V I F K T K
 ACC UCU GGC AAA UGC CCG CAG AAA GCG GUG AUC UUU AAA ACC AAA

 L A K D I C A D P K K K W V Q
 CUG GCG AAA GAU AUU UGC GCG GAU CCG AAA AAA AAA UGG GUG CAG

 D S M K Y L D Q K S P T P K P
 GAU UCU AUG AAA UAU CUG GAU CAG AAA UCU CCG ACC CCG AAA CCG

 UAA

FIG. 35

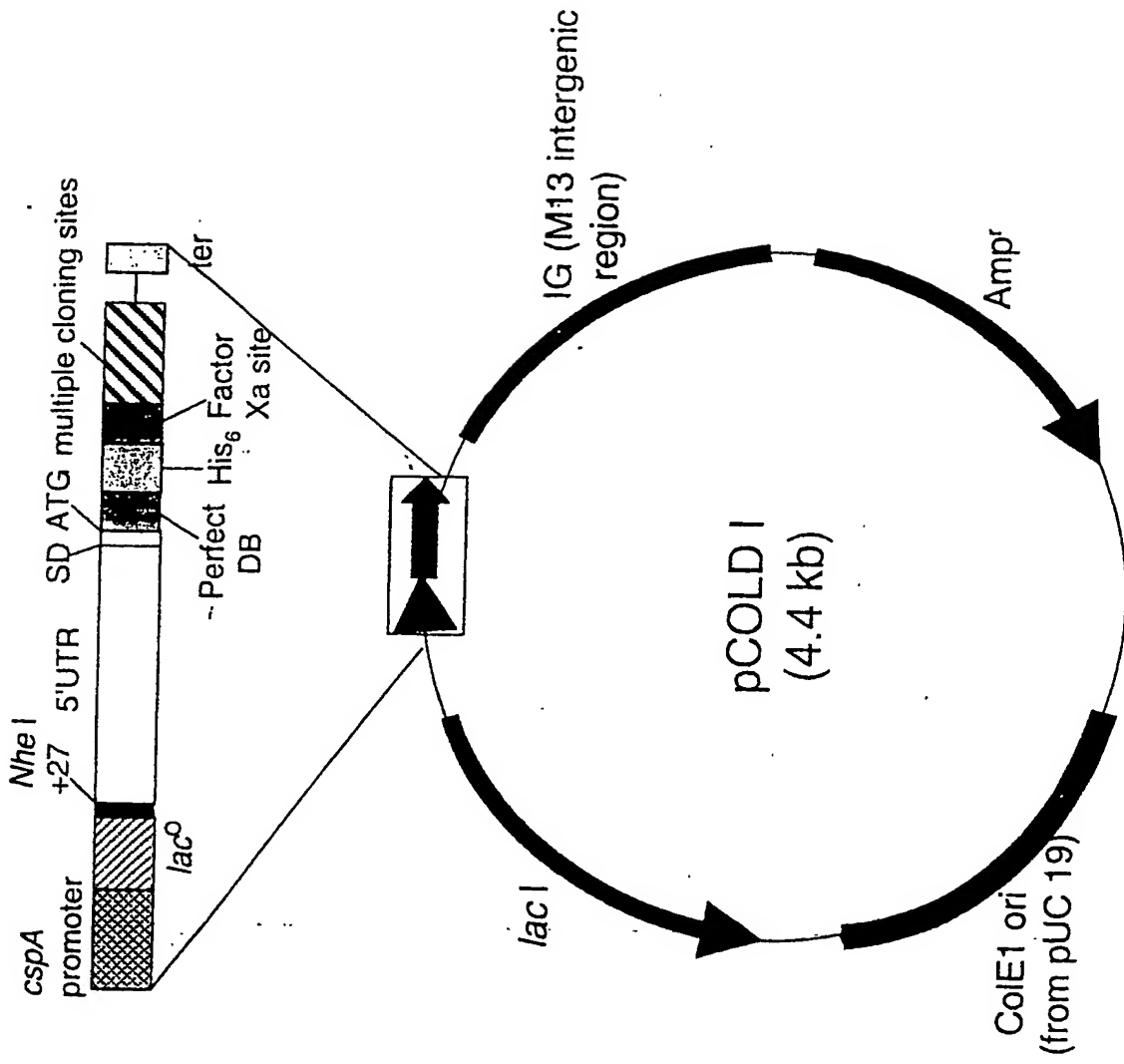


FIG. 36

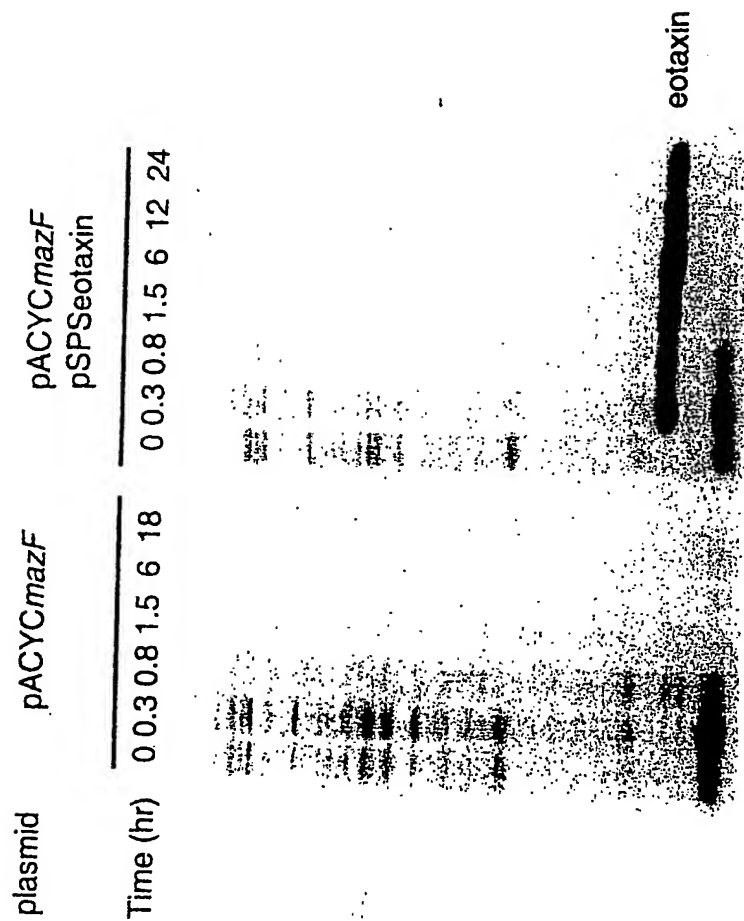


FIG. 37

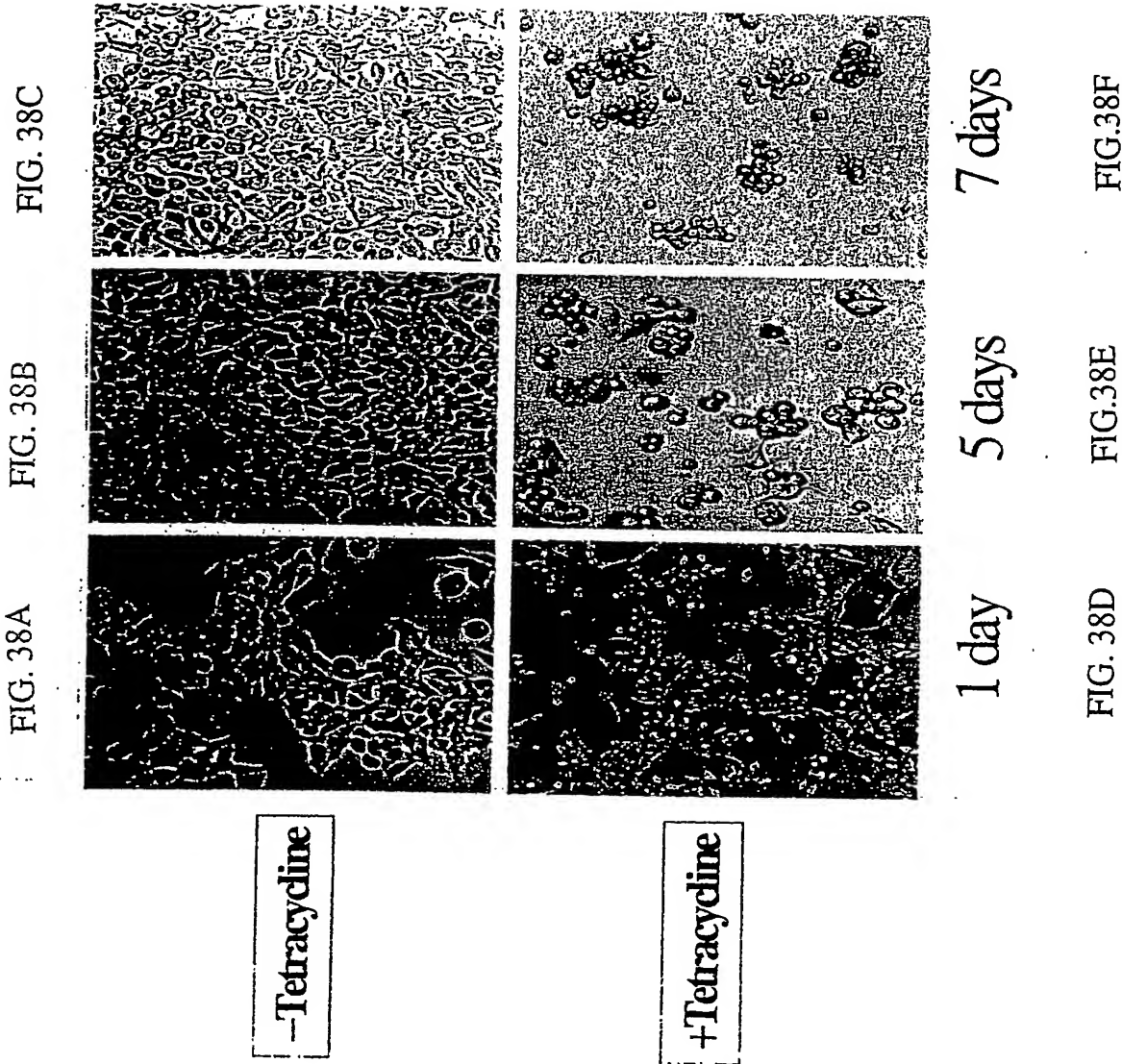


FIG.39A

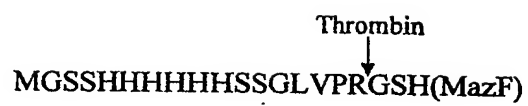
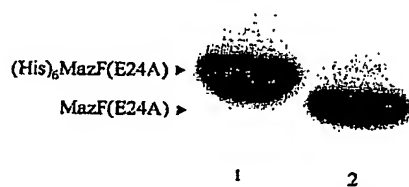


FIG.39B



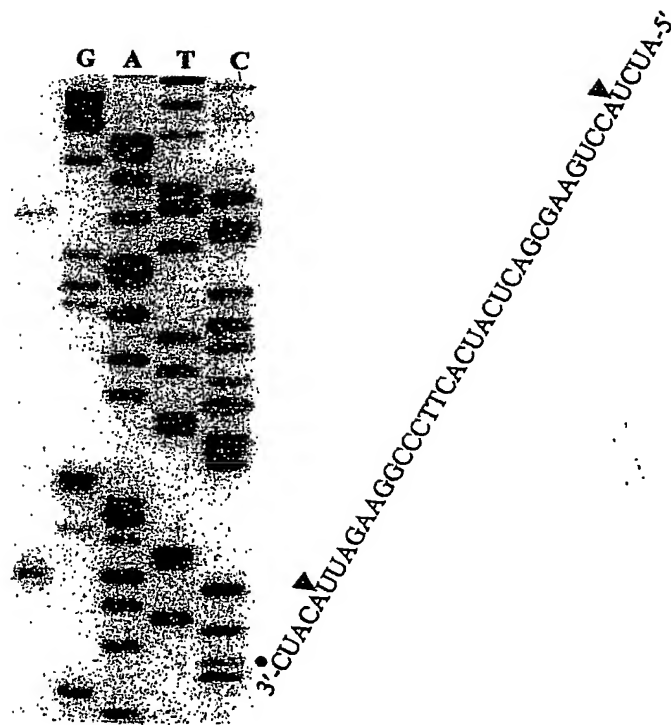


FIG.40

FIG.41A

```

Rv0456A      1  -----MLRGEI WQVDLD PARGS AANMRRPFAVIVSNDRANAAAIRLDRGV
Rv2801c      1  -----MMRRGEI WQVDLD PARGS EANNQRPVAVVSNDRANATATRLGRGV
MazF         1  MVSRYVPDMGDLI WVD F D PTKGSEQA GHRPAVVLSPFMYNN-----KTGM
Rv1991c      1  -----MVISRAE IYNADLGP PSGSQPAKR R PVLV IQSDPYNAS-----RLAT
Rv0659c      1  -----MMRRGEI WFAAT-----PGGDRPV LVLT RDPVAD-----RIGA
Rv1942c      1  --MTALPARGEVWNCEMA-----EIGRRRPVVVLSRDAAIIP-----RIIR
consensus    1  --      1      rg evw w em                grRPvvvls d a -----rl

```

```

Rv0456A      45  VPVVPVTSNTEKVP I PGVVAGSERWPGRRFEGAGPAGWIRRCATSPLPS-
Rv2801c      46  ITVVPVTSNIAKV-YPFQVLISATTTGLQVDCKAQAQEQIRSIATERLLLRP
MazF         46  CECVPCCTQSKGY--PFEVVL S-----GQERDGVALA DQVKSIAWRARGAT
Rv1991c      43  VIAAVITSNATAAAMPGNVFLPATTTTRLPRDSVNVVTAIVTINKTDLTDR
Rv0659c      33  VVVVALTRTRRGLVSELELTAVEN--RVPSDCV VNFEDNIHTLPTAFRRR
Rv1942c      38  ALVAPCTTTIRGLASEVVL EPGSD--PIPRSAVNLD S VESVS VAVLVNR
consensus    51  lv p Tt rgl      l      s -- ipr      vn d v svs      l r

```

```

Rv0456A      95  -----
Rv2801c      90  IGRVSAAE LAQLDEAL KKLHL DLWS
MazF         93  KKGTVAPEELQLIKAKINVLIG--
Rv1991c      93  VGEVPASL MHEVDRGLRRVLDL--
Rv0659c      81  ITRLSPARLHEACQTLRASTGC--
Rv1942c      86  UGRLADIR MRALCTALEVAVDCSR
consensus    101 lgrla      mr i      al      vd

```

FIG.41B

```

B.subtilis   1  ----MIVKRGDVYFADLS PVV GSEQGGVRPV LV I QNDIGNRFSPTAIVAA
B.anthraxis 1  ----MIVKRGDVYFADLS PVV GSEQGGVRPV LV I QNDIGNRFSPTVIVAA
S.aureus     1  ----MIRRGDVYLADLS PVV GSEQGGVRPV LV I QNDTGNKYSETVIVAA
E.coli       1  MVSRYVPDMGDLI WVD F D ETRKGSEQA GHRPAVVLSPFMYN--NKTGMCLC
consensus    1  v      GDl w D P GSEQaG RP vvl      m N      Tgm

```

```

B.subtilis   47  ITAQIQKAKLP THVEIDAKRY GFERDSVILLE QIRTIDK-QRLTDKITHL
B.anthraxis 47  ITAQIQKAKLP THVEIDAKRY GFERDSVILLE QIRTIDK-QRLTDKITHL
S.aureus     46  ITGRINKAKIP THVEIEKKKY KLDND SVILLEQIRTLDK-KRLKEKLYL
E.coli       49  VPCTTQSKGY PFEVVL S-----GQERDGVALA DQVKSIAWRARGATKKGTV
consensus    51  v      q      P V l      g erD V L dQvksi      R      K      v

```

```

B.subtilis   96  DDEMMDKVDEALQISLALIDF-----
B.anthraxis 96  DEVMMIRVDEALQISLGLIDF-----
S.aureus     95  SDDKMKEVDNALMISLGLNAVAQPEKLGVIYYMYFSEINKILI
E.coli       95  APEELQLIKAKINVLIG-----
consensus    101 a e l i      inv ig      -----

```

M	V	S	R	Y	V	P	D	M	G	D	L	I	W	V	D	F	D	P	T
AUG	GUA	AGC	CGA	UAC	GUA	COC	GAU	AUG	GGC	GAU	CUG	AUU	UGG	GUU	GAU	UUU	GAC	CCG	ACC
K	G	S	E	Q	A	G	H	R	P	A	V	V	L	S	P	F	M	Y	N
AAA	GGU	AGC	GAG	CAA	GCU	GGU	CUU	CGU	CCA	GCU	GUU	GUC	CUG	AGU	CCU	UUC	AUG	UAU	AUU
N	K	T	G	M	C	L	C	V	P	C	T	T	Q	S	K	G	Y	P	F
AUU	AAA	ACC	GGU	AUG	UGU	CUG	UGU	GUU	CCU	UGU	ACC	ACG	CAA	UCA	AAA	GGA	UAU	CCG	UUC
E	V	V	L	S	G	Q	E	R	D	G	V	A	L	A	D	Q	V	K	S
GAA	GUU	GUU	UUA	UOC	GGU	CAG	GAA	CGU	GAU	GGC	GUA	GCG	UUA	GCU	GAU	CAG	GUA	AAA	AGU
I	A	W	R	A	R	G	A	T	K	K	G	T	V	A	P	E	E	L	Q
AUC	GOC	UGG	CGG	GCA	AGA	GGA	GCA	ACG	AAG	AAA	GGA	ACC	GUU	GOC	CCA	GAG	GAA	CUG	CUA
L	I	K	A	K	I	N	V	L	I	G									
CUC	AUU	AAA	GOC	AAA	AUU	AAC	GUA	CUG	AUU	GGG	UAG								

FIG.42

FIG. 43A nucleic acid sequence of Mazf-mt1 (NP_217317) (SEQ ID NO: 69)

gtgatgcgcc gcggtgagat ttggcaggtc gatctcgacc ccgctcgagg tagcgaagcg
aacaaccagc gccccgccgt cgtcgtcagc aacgaccggg ccaacgcgac cgccacgcgt
cttggggcgcg gcgtcatcac cgtcgtgccg gtgacgagca acatcgccaa ggtctatccg
tttcaggtgt tgttgctcggc caccactact ggtctccagg tcgactgcaa ggccgaggcc
gagcaaatca gatcgattgc taccgagcgg ttgctccggc caatcgcccg agtttcagcc
gccgaacttg ccagctcga tgaggctttg aaactgcac tcgacttatg gtcgtag

FIG. 43B nucleic acid sequence of Mazf-mt2 (CAE55283) (SEQ ID NO: 70)

atgctgcgcg gtgagatctg gcaggtcgac ctggatccgg cccgcggcag cgcggaat
atcgggcggc cagcggtaat tgcagcaac gacagggcca acgctgccgc gatacgtctc
gaccgaggcg tggtgccggc tgtcccgggt accagcaaca ccgaaaaggc cccattcca
ggtgttggc cgggcagcga gcggtggcct ggccgtcgat tcgaaggcgc aggccagca
ggttgatcc gtcgtcgcg aacgtctccc ctgccgagct ga

FIG. 43C nucleic acid sequence of Mazf-mt3 (CAA98393) (SEQ ID NO: 71)

gtgggtgatta gtcgtgccga gatctactgg gctgacctcg ggccgccatc aggagtcag
ccggcgaagc gccgcccggc gtcgtaatc cagtcagatc cgtacaacgc aagtcgcctt
gccactgtga tcgcagcggc gatcacgtcc aatacggcgc tggcggcaat gcccggaac
gtgttcttgc ccgcgaccac aacgcgactg ccacgtgact cggctcgtaa cgtcacggcg
attgtcacgc tcaacaagac tgacctcacc gaccgagttg gggaggtgcc agcgagcttg
atgcacgagg ttgaccgagg acttcgtcgc gtactggacc tttga

FIG. 43D nucleic acid sequence of Mazf-mt4 (CAB09387) (SEQ ID NO: 72)

atcgggcgcg gtgaattgtg gtttgccgcc acacctgggtg gtgacagacc agtacttgtc
cttaccagag atccgggtggc agaccgcac gccgcggtcg ttgtggtggc cctaaccgc
accgcccag gcttggtgtc ggaattggag ctcacggcgc tcgaaaaccg tgttccgagc
gactgcgtcg tcaacttcga caacattcat acgttgccac gcaccgcatt ccgacggcg
atcaccggc tgtccccggc ccgcctgcac gaagcctgtc aaacactccg ggcgagcac
gggtgttga

FIG. 43E nucleic acid sequence of Mazf-mt5 (CAB06519) (SEQ ID NO: 73)

gtgaccgcac ttccggcgcg cggagaggtg ttggtggtgt agatggctga gatcggtcgg
cgaccagtcg tcgtgctgtc gcgcatgcc gcgatccctc ggctgcgacg cgcacttgtc
gcgccctgca ccacgaccat ccgagggtga gccagtggag ttgttcttga acccggttcc
gaccgatcc cgcgccgttc cgcggtgaat ttggactcag tcgaaagtgt ctcggtcgcg
gtattggtga atcggttgg ccgcctcgcc gacatccgga tcgcgcgcat ctgcacggcc
ctcgaggtcg ccgtcgattg ctctcgatga

FIG. 44A amino acid sequence of Mazf-mt1 (NP_217317) (SEQ ID NO:74)

MMRRGEIWQV DLDPARGSEA NNQRPAVVVS NDRANATATR LGRGVITVVP VTSNIAKVYP
FQVLLSATTT GLQVDCKAQA EQIRSIATER LLRPIGRVSA AELAQLDEAL KLHLDLWS

FIG. 44B amino acid sequence of Mazf-mt2 (CAE55283) (SEQ ID NO:75)

MLRGEIWQVD LDPARGSAAN MRRPAVIVSN DRANAAAIRL DRGVVPVVPV TSNTEKVPIP
GVVAGSERWP GRRFEGAGPA GWIRRCATSP LPS

FIG. 44C amino acid sequence of Mazf-mt3 (CAA98393) (SEQ ID NO:76)

MVISRAEIIW ADLGPPSGSQ PAKRRPVLVI QSDPYNASRL ATVIAAVITS NTALAAMPGN
VFLPATTTRL PRDSVVNVTA IVTLNKTDLT DRVGEVPASL MHEVDRGLRR VLDL

FIG. 44D amino acid sequence of Mazf-mt4 (CAB09387) (SEQ ID NO:77)

MRRGELWFAA TPGGDRPVLV LTRDPVADRI GAVVVVALTR TRRGLVSELE LTAVENRVPS
DCVVNFDNIH TLPRTAFRRR ITRLSPARLH EACQTLRAST GC

FIG. 44E amino acid sequence of Mazf-mt5 (CAB06519) (SEQ ID NO:78)

MTALPARGEV WWCMAEIGR RPVVVLSRDA AIPRLRRALV APCTTTIRGL ASEVVLEPGS
DPIPRRSVN LDSVESVSVA VLVNRLGRLA DIRMRAICTA LEVAVDCSR

Figure 45A nucleic acid sequence of *Pseudomonas putida* Pem-like gene (KT2440) (SEQ ID NO: 81)

```

          gtgaa acggttgaaa ttcgccaggg gtgatattgt
tcgcgtcaac ctggacccaa cagtcgggcg ggaacagcag ggctccggcc gacctgcact
ggtacttact ccggctgcgt tcaatgcttc aggcctggct gtaatcatcc cgatcactca
aggtggggat ttccgcgaggc atgcggggtt cgtgtcacg ctcagcgggtg cgggcacgca
gactcagggg gtgatgcttt gcaaccaggt gcgcacagtc gaccttgaag cagcatttgc
caagcgcata gagtcggtgc ctgaagctgt catcctggat gcactggcgc gtgtgcaaac
cctattcgat taa

```

Figure 45B nucleic acid sequence of *Mycobacterium celatum* Pem-like gene (SEQ ID NO: 82)

```

          t gaattgctct gacggaacgc
ggcgacatct acatcgtttc gcttgaccgc acgtcgggac atgagcagag cggcacgcgc
ccagtattgg tcgtgtcccc gggcgcggtt aatcgctga cgaaaacacc ggtcgtgcta
cctataacac gcgggcggaa ctttgcccga acggcagggg tcgctgtctc gctgaccgat
gcgggtactc gcaccgcggc cgtaatacgc tgcgatcagc ctcgctcgat tgatatccgc
gcccgtaaag gccgcaaggc tgaacgtgtg ccgtctgggg ttcttgacga agcgttggcc
aagctcgcca cgatcttgac ttga

```

Figure 45C nucleic acid sequence of *Shigella flexneri* 2a str. 301 Pem-like gene (SEQ ID NO: 83)

```

          atggtaaag gcacggacgc
cacatcgtgg tgagatctgg tattttaacc ctgatccggt tgccgggcat gaacttcagg
ggccacatta ttgcattgtg gtaacggaca aaaaactcaa caatgtttta aaagttgcta
tgtgtgccc gatttcaaca ggggcaaatg cagcacgttc cacaggggtg acggtgaacg
tcctcccccg tgatacgcaa accggtaacc tgcattggcg tgtactttgt caccagctaa
aagccgtcga tcttattgcc cgtggcgcta aatttcatac cgttgccgat gaaaaattga
ttagtgaagt tatcagtaaa ctggtgaatt taatcgaccc acaataa

```

Figure 45D nucleic acid sequence of *E. coli* ChpBK (SEQ ID NO: 84)

```

          atggt aaagaaaagt gaatttgaac
ggggagacat tgtgtgtggt ggctttgatc cagcaagcgg ccatgaacag caaggtgctg
gtcgacctgc gcttgtgtc tccgttcaag cctttaatca actgggaatg acgctgggtg
ccccattac gcagggcgga aattttgccc gttatgccgg atttagcgtt cctttacatt
gcgaagaagg cgatgtgcac ggcgtgggtg tggatgaatc ggtgcggatg atggatctac
acgcccggct ggcaaaagcgt attggtctgg ctgcggatga ggtggtggaa gaggcgttat
tacgcttgca ggcggtggtg gaataa

```

FIG. 46A amino acid sequence of *Pseudomonas putida* KT2440 Pem-like protein (SEQ ID NO: 85)

MKRLKFARGD IVRVNLDPTV GREQQGSGRP ALVLTAAAFN ASGLAVIPI TQGGDFARHA
GFAVTLGAG TQTQGVMLCN QVRTVDLEAR FAKRIESVPE AVILDALARV QTLFD

FIG. 46B amino acid sequence of *Mycobacterium celatum* Pem-like protein (SEQ ID NO: 86)

MTERGDIYIV SLDPTSGHEQ SGRFVLVVS PGAFNRLTKT PVVLPITRGG NFARTAGFAV
SLTDAGTRTA GVIRCDQPRS IDIRARKGRK VERVPSGVLD EALAKLATIL T

FIG. 46C amino acid sequence of *Shigella flexneri* 2a str. 301 Pem-like protein (SEQ ID NO: 87)

MVKARTPHRG EIWFNPDPV AGHELQGPY CIVVTDKLN NVLKVAMCCP ISTGANAARS
TGVTVNVLPV DTQTGNLHGV VLCHQLKAVD LIARGAKFHT VADEKLISEV ISKLVNLIDP
Q

FIG. 46D amino acid sequence of *E. coli* ChpBK (SEQ ID NO: 88)

MVKKSEFERGDIVLVGFDPASGHEQQGAGRPALVLSVQAFNQLGMTLVAPITQGGNFARYAGFSVPLHCEEG
DVHGVVLVNQVRMMDLHARLAKRIGLADEVVEEALLRLQAVVE

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